

FINAL ANNOUNCEMENT AND CALL FOR PAPERS

16th - 19th September 2019

Abstract deadline: May 20th, 2019



2019 Fall Meeting

The conference will include:

22 parallel symposia, one plenary session, one exhibition and much more

Conference and exhibition will be held
at the Main Campus of the Warsaw University of Technology

Plac Politechniki 1 - Warsaw, Poland

www.european-mrs.com



E-MRS 2019 FALL MEETING

16th-19th September
Warsaw University of Technology - POLAND

Introduction

The European Materials Research Society (E-MRS) was established in 1983 through the initiative of individual European Materials scientists. A number of European materials scientists who attended the MRS meetings in the U.S.A. realised that such a society could be of benefit to Europe to enhance the links between materials science and industry and to provide a voice for the materials community. Most of the problems facing the world such as energy supply and health will be solved only by breakthroughs in materials science. It is vital that the outcomes of research are utilised through technological experience and innovation for the benefit of mankind. The Fall Meeting provides the opportunity to exchange ideas, expand one's knowledge and make new contacts. The conference will consist of 22 parallel symposia and a plenary session and provides an international forum to discuss recent advances in the field of materials science. The conference will be augmented by an exhibition of products and services of interest to the conference participants. The Conference will be held at the Central Campus of the Warsaw University of Technology, from 16th to 19th September 2019. It is the 17th E-MRS Fall Meeting following its launch in 2002 to run in parallel to the Spring Meeting in France.

Don't miss it! We look forward to welcoming you to Warsaw and your active contribution and participation in the conference.

The European Coordination Group



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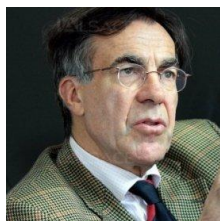
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The Conference Organizers:



European Materials Research
Society



Warsaw University
of Technology



Polish Materials Science
Society



Institute of Physics
PAN

Plenary Session (Wednesday morning, 18th September)

1. Presentation of the Jan Czocharski Award to Professor Donal D.C. Bradley, Mathematical, Physical and Life Sciences Division & Departments of Engineering Science and Physics, The University of Oxford, United Kingdom
Lecture by Professor Donal D.C. Bradley
2. Lecture by Professor Aaron Thean, National University of Singapore
3. Lecture by Professor Avi Schroeder, Israel Institute of Technology

Poster Sessions:

1. Monday, 16th September - 17:30 – 19:30
2. Tuesday, 17th September - 17:30 – 19:30

Scheduled Symposia (16th – 19th September):**INFORMATION AND COMMUNICATION TECHNOLOGIES**

| | | |
|-----------|-----|---|
| Symposium | A : | Ion-related phenomena in nanoscale oxide systems: from fundamentals to applications |
| Symposium | B : | Integration of advanced materials on silicon: from classical to quantum applications |
| Symposium | C : | Fabrication and characterization of emerging transparent conductive materials |
| Symposium | D : | Materials for nanoelectronics and nanophotonics |
| Symposium | E : | Caloric materials for efficient heat management applications: advances and challenges |
| Symposium | F : | Novel Approaches for Neuromorphic Computing: Materials, Concepts and Devices |
| Symposium | G : | Diamond for Electronic Devices IV |
| Symposium | H : | New materials for photonics |

ENERGY AND ENVIRONMENT

| | | |
|-----------|-----|---|
| Symposium | I : | Materials for Energy Applications: Li-ion, Na-ion Batteries, supercapacitors and beyond, perovskite-type Solar cells and beyond |
| Symposium | J : | Computational materials sciences for efficient water splitting with nanocrystals from abundant elements |
| Symposium | K : | Nuclear materials under extreme conditions |
| Symposium | L : | Beyond hydrogen storage – Metal hydrides as multifunctional materials for energy storage and conversion |
| Symposium | M : | Metal oxide- and oxyhydride-based nanomaterials for energy and environment-related applications |
| Symposium | N : | Advanced catalytic materials for (photo)electrochemical energy conversion |

MANUFACTURING

| | | |
|-----------|-----|--|
| Symposium | O : | Towards a Green Strategy for Materials Recycling. Two Focusing Domains: High Added Materials & CO ₂ For Innovative Applications |
| Symposium | P : | 3D Printing and Additive Manufacturing for the Industry of the Future |

FUNDAMENTALS

| | | |
|-----------|-----|--|
| Symposium | Q : | Nanoparticles: advances in synthesis, characterization, theoretical modelling, and applications |
| Symposium | R : | Surface and Interfaces of Nanocarbons |
| Symposium | S : | New frontiers for the in-situ and operando spectroscopic investigation of interfaces applied to catalysis and electrochemistry |
| Symposium | T : | Nanomaterial thermal properties and nanothermodynamics |
| Symposium | U : | X-ray based techniques for sustainable energy related materials |
| Symposium | V : | Bioinspired and Biointegrated Materials as New Frontiers Nanomaterials IX |

Introduction and scope:

Local ionic effects in oxide systems are emerging as a pivotal aspect in nanoionics, iontronics, catalysis and energy storage. This symposium focuses on the recent advances in understanding and controlling nanoscale ionic effects, and on their application in novel solid-state microdevices.

Functional oxide systems are at the basis of a whole new-generation of miniaturized solid-state devices for electronics, energy conversion and energy storage. In these systems, the role of ionic structure and defects (dopant element distribution, dislocations, grain boundaries, interfaces and surfaces) and the local interaction between ionic and electronic species play a pivotal role and can become predominant over the expected bulk behavior. These nanoionic effects may lead to the improvement of existing functionalities or even to the emergence of novel states, that can be harvested for application. The possibility of fabricating layered heterostructures and "interface-dominated" materials as well as of controlling nanoscale phenomena and dimensionality is key for a rational use of such materials in technology.

This symposium is aimed to bridge the fundamentals of oxide local structures with device fabrication and oxide implementation into real devices. It will provide a forum for discussion on oxide physics and chemistry, including surface activity, space-charge effects, local non-stoichiometry, strain, high electron and ion mobility states, and mass transport at the interfaces. Furthermore, it will focus on the practical utilization of such effects for several applications including solid oxide fuel cells, memories and neuromorphic devices, gas sensors, electrolyzers and microbatteries. Attention will be put on state-of-the-art techniques for thin-film fabrication such as PLD, sputtering, ALD, MBE and on strategies for their scalability such as large area deposition, epitaxy on Si and film transfer onto technological supports. Advances on microscopy, spectroscopy and electrical methods for local characterization will be discussed.

Hot topics to be covered by the symposium:

- Local electrical transport engineering: space-charge, local non-stoichiometry, strain, high-dimensional defects, etc.
- Mass and charge transport at interfaces and surfaces
- Ion-driven electronic effects
- Interface-dominated architectures: grain boundaries, dislocations, multilayers
- Interface investigation techniques
- Advances in fabrication methodologies for thin-films
- Light-driven ionic phenomena
- Memristive devices and neuromorphics
- Water and oxygen reactivity based on oxides/ionic configuration
- Micro solid state devices: fuel cells, memristors, batteries, thin-film transistors, etc.

List of invited speakers:

- Guus Rijnders (University of Twente, NL)
- Scott Chambers (Pacific Northwest National Laboratory, USA)
- Vesna Srot (Max Planck Institute DE)
- Ainara Aguadero (Imperial College, UK)
- Albert Tarancon (ICREA, ES)
- Markus Kubicek (Technical University Wien, AT)
- Vincenzo Esposito (Technical University of Denmark, DK)
- Mark Huijben (University of Twente, NL)
- Christoph B umer (Stanford University, USA)
- Martin Setvin (Technical University Wien, AT)
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- Rainer Waser (RWTH Aachen University, DE)
- Judith MacManus-Driscoll (University of Cambridge, UK)
- Regina Dittmann (Forschungszentrum J lich, DE)

"The symposium will host a special session "Harvestore - Heat and light for powering the Internet of Things" in which a selection of invited and contributed speakers will focus on the latest advances in the fields of energy harvesting and of micro-devices".

Symposium Organizers:**Felix GUNKEL**

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Deadline for abstract submission: **20th May, 2019**

www.european-mrs.com

Introduction and scope:

The symposium aims at gathering scientists working on monolithic and heterogeneous integration of new materials, to enable additional functionalities on silicon-based platforms. Its originality lies in the fact that it considers both classical approaches and emerging topics linked to quantum applications.

The microelectronics industry has delivered faster and more efficient computing devices at a remarkably consistent pace for several decades. This has mostly been achieved by downscaling classical MOS transistors, which continuously provided improved performance and lower energy consumption for every new technology node. However, transistors cannot scale down indefinitely. Industrials are therefore looking beyond classic architectures and concepts to secure future generations of devices. Still, the best contenders are likely to be those that can be integrated with conventional silicon chip platform.

For quantum information science, silicon is also emerging as a promising route. Elementary silicon qubit devices have been demonstrated with high-fidelity operation highlighting the potential of silicon-based quantum devices. Programmable quantum circuits based on silicon photonics chip are currently extensively investigated. Even for emerging quantum materials, like topological insulators, quantum-dots structures, magnetic or superconductor materials, silicon could be a platform of choice for device integration.

The symposium aims to highlight novel and innovative approaches that allow monolithic and heterogeneous integration on silicon technology, targeting CMOS, application-specific integrated solutions or quantum systems.

The scope includes the fundamental understanding of new material properties, the implementation of novel integration schemes, the modeling techniques and new application fields. The focus will be on the fabrication, characterization and simulation of materials considered as non-standard for Si technology. Contributions related to innovative hetero-integration techniques will be encouraged. Finally, a particular attention will be given to devices and applications beyond current computation technologies that aim at addressing new computing paradigms such as quantum and neuromorphic computation. The productive interaction across disciplines will help materials scientists drive the exciting transition towards higher-value, highly functionalized Si-based microelectronics.

Hot topics to be covered by the symposium:Material growth, characterization and simulation:

- *Group IV and compound semiconductors:* SiGe, GeSn SiGeSn, III-V and II-VI
- *Group IV and III-V quantum dots and nanowires integrated on Si.*
- *Oxides and nitrides:* Perovskites, ZnO, GaN, oxides with resistive or metal insulator transition, piezoelectric materials.
- *2 dimensional materials:* Graphene, Dichalcogenides, Boron Nitride, hybrid 2D/semiconductor devices.
- *Novel materials for Quantum applications:* Semiconductor/Superconductor Interfaces, Topological insulators, Semiconductor Quantum Dot qubit Materials, purified ^{28}Si , Spin qubit, Si/SiGe Heterostructures.

Integration Techniques:

- *Advanced heteroepitaxy:* Selective growth, epitaxial lateral overgrowth, self-assembly, remote epitaxy.
- *Layer Transfer: Bonding, SOI substrates, 2.5D & 3D integration schemes (monolithic & heterogeneous).*
- *Innovative synthesis & integration methods of materials and devices used for quantum systems.*

Applications:

- *Data processing and communication:* Advanced CMOS scaling, single electron & photon devices, neuromorphic architectures, IOT, spintronics, ultra-low power & RF electronics, Integrated photonics, IR and THz lasers.
- *Quantum information science and emerging applications of quantum materials:* Quantum communication, quantum computing, quantum sensing.
- *Life-Sciences application and environmental sensors:* Semiconductor plasmonics, mid-infrared and THz sensing, gas sensors, integration with piezo-materials for MEMS-like sensors and opto-mechanics.

List of invited speakers:

- Abderraouf Boucherif, Sherbrooke university, Canada.
- Ageeth A. Bol, Eindhoven University of Technology, Netherlands.
- Akira Toriumi, Tokyo university, Japan.
- Antonio di Bartolomeo, Università degli Studi di Salerno, Italy.
- Detlev Grutzmacher, Forschungszentrum Jülich, Germany.
- Douglas Paul, Glasgow University, UK.
- Farid Medjdoub, IEMN / CNRS, France.
- Giordano Scappucci, QUTech, TU-Delft, Netherlands.
- Jonatan Slotte, Aalto university, Finland.
- Lucas Pirro, Global Foundries Dresden, Germany.
- Lukas Czornomaz, IBM Zurich, Switzerland.
- Maud Vinet, CEA/LETI, France.
- Nikolay Abrosimov, IKZ Berlin, Germany.
- Thierry Baron, LTM/CNRS, France.
- Thierry Taliercio Univ Montpellier, CNRS, IES, France.

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- G. Patriarche, CNRS Saclay, France.
- V. Kaganer, PDI Berlin, Germany.
- H. Liu, U.C. London, UK.
- M. Cousineau, INP/CNRS, France.
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Deadline for abstract submission: **20th May, 2019**

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Introduction and scope:

Transparent conducting materials have been extensively studied in recent years due to the great interest for applications such as photovoltaics, transparent electronics, optoelectronics, light emitting diodes, smart windows, flat panel displays, touch screens and more. This symposium covers various topics from synthesis, characterization to device fabrication with the aim of a better understanding of emerging TCM's fundamental properties and to improve their integration.

Transparent conductive materials are able to simultaneously conduct electricity and transmit visible light, a valuable dual asset for various application fields like transparent electronics or photovoltaics. There are typically obtained by strongly doping the wide band gap semiconductors, although novel materials (silver nanowires, graphene or carbon nanotubes) got lately into attention. The most commonly used TCM is Tin-doped Indium Oxide (ITO) with a transmittance greater than 80% in the visible range and a n-type electric conductivity up to 1000 S/cm. The lack of a corresponding p-type semiconductor with electrical and optical properties matching these values impedes the fabrication of a fully transparent active device. Moreover, the need for additional functional properties (such as flexibility) and cost efficiency (Indium cost, deposition temperature) require alternative materials:

Recent efforts in field of TCMs are therefore directed at:

- Indium-free TCM as Indium worldwide reserve decreases affecting the prices
- New deposition methods able to fulfill technological and environmental requirements:
 - low cost deposition methods;
 - reduced processing temperatures,
 - reduced solvent use and the avoidance of pollutants.
- p-type semiconductors, crucial for transparent active devices (diodes, transistors, smart windows...)
- Tailoring optoelectronic properties of TCM for a good assimilation within the multi-stacks
- The successful integration of any such emergent TCMs into working devices.

The goal of the proposed symposium is then to address the above-mentioned matters. The latest advances the topical research field of transparent conducting materials will be discussed. The symposium will be concerned with both experimental and theoretical approaches. Topics ranging from fabrication until device integration will be covered. Various deposition techniques will be discussed as their important influence on the physical properties of materials was intensively reported. A special focus on the relationship between the structure and the properties of thin films will be addressed in order to fabricate materials with novel or substantially improved properties. Deeper theoretical insights into the materials will be sought and correlated to mechanisms responsible for key electrical and optical properties with the goal to develop or validate new TCM related computational techniques. Last but not least aspects related to the fabrication of device with integrated TCM's will be discussed.

Hot topics to be covered by the symposium:

- Novel p-type TCMs
- Low temperature thin films' deposition techniques
- Transport mechanism in novel amorphous TCMs
- The source of doping and transport mechanisms in p-type TCOs
- Simulation and modelling of TCM for understanding the properties
- Nanostructured TCOs (nanowires, composite, laminates,)
- Integration of TCM in functional devices
- Electrical, Optical and Structural analysis of TCM
- Tailoring the electrical and optical properties of TCM
- Defect chemistry of TCM
- Emerging non-oxide TCM (iodines, oxysulphides)

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Deadline for abstract submission: **20th May, 2019**

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Introduction and scope:

This symposium will cover:

- (i) Materials Synthesis: From 0D to 3D functional nanomaterials including hybrids.
- (ii) Properties: Electronics, optical, photonics, luminescent (experimental, analytical, modelling).
- (iii) Applications: Electronics, sensing, photonics, plasmonics, luminescent, optoelectronics, energy.

Nanostructures, particularly from inorganic materials, ceramics, carbon, etc. family, are very important candidates because of their extremely high surface-to-volume and morphology-dependent extraordinary properties suitable for many advanced technologies. The ongoing deployments in the direction of confined nanostructures (0D, 1D, 2D) and their porous interconnected 3D networked materials have further become very relevant towards various applications. The porous 3D network material built out of nanoscale building blocks, offers very lot of utilization simplicities and simultaneous easy accessibility of nanoscale features make them very excellent candidates for applications, especially towards electronics and optics. Due to their compact synthesis forms, they can be easily handled or integrated in the desired manner in nanoelectronics devices or sensors. The confined nanostructures from noble metals (Au, Ag, Cu, etc.) have found immense applications in electronics, optoelectronics, sensing, photonics, and waveguides, etc. Nanostructures from metal oxides have been very interesting (fundamental as well applied) materials due to interesting bandgap values (intermediate between metals and insulators), suitable for various advanced electronic, optical, optoelectronic and sensing technologies. When these metal oxides and metals are combined together in nanohybrids, they become further very relevant in terms of understanding the properties and accordingly electronics and optoelectronics applications. The carbon nanostructure family, i.e., fullerenes, carbon nanotubes, graphene, graphene oxide, etc., have shown very strong potentials in terms of fundamental properties as well as advanced electronics and optical applications and hence have been the subject of huge research attention in the last couple of decades. Recent developments in the direction of 3D carbon based networked materials have opened many new avenues in the direction of electronics and optics fields. The research on metal oxide nanostructures based three dimensional interconnected ceramics networks is currently in the main focus because they can be utilized as unique backbone for developing hybrid nanomaterials. The nanostructures from inorganic, metal oxide and carbon, etc. materials can be easily integrated in form of hybrid 3D networks which involves new structure dependent electronic and optical features for advanced nanoelectronics and nanophotonics related applications.

Appropriate growth strategies of different confined nanostructures using simple methods, understanding their different properties, and applications of these pure and hybrid nanomaterials in the direction of nanoelectronics and nanophotonics are key fundamental issues to which this proposed symposium in EMRS Fall 2019 is going to briefly address. Researchers with interdisciplinary expertizes could easily help each other to realize the materials growth and corresponding structure-property relationships. In this proposal it is aimed to bring: (i) synthesis groups for developing different nanostructures, (ii) theoretical/modelling scientists, (iii) experts from electronics and photonics fields who can accordingly utilize these materials in various applications, together to develop a discussion platform with the theme 'materials for nanoelectronics and nanophotonics' at European Materials Society Fall meeting in 2019 in Warsaw, Poland. Over the last few years, halide perovskite nanocrystals have gained significant attentions from electronics and photonics aspects. They have been intensively explored for light emission and photovoltaic applications. Recent developments towards synthesis, theoretical and applications of these perovskite nanocrystals will also be covered in this symposium during EMRS Fall 19 in Warsaw.

Hot topics to be covered by the symposium:

- Hybrid nanomaterials: Synthesis, Characterizations, Structure-property relations, Analytical and simulation studies, Applications: Nanoelectronics, Sensing, Nanophotonics, Optics, Luminescent, etc.
- Nanoelectronics: Electronics, Sensing, Energy, Photovoltaics, Piezoelectric, Piezotronics, etc.
- Nanophotonics: Optics, Photonics, Plasmonics, Tera Hz optics, Luminescent, Waveguides, Whispering gallery modes, Light emitting diodes, Lasers, Imaging, Advanced lightening technologies, etc.
- Nano optoelectronics: UV and photodetection, Photovoltaics, Solar cells, Piezophotonics, etc.

List of invited speakers:

- Prof. Andrea S. Ferrari, Cambridge University, UK
- Prof. Rodney S. Ruoff, IBS-UNIST, South Korea
- Prof. Oliver G. Schmidt, IFW Dresden
- Prof. Sotiris E. Pratsinis, ETH Zurich, Switzerland
- Prof. Zhong Lin Wang, Georgia Tech, USA
- Prof. Kostya K. Ostrikov, Queensland University of Technology, Brisbane, Australia
- Prof. Sanjay Mathur, Köln University, Köln, Germany
- Prof. Ali Khademhosseini, University of California Los Angeles, USA
- Prof. Sang Sub Kim, Inha University, South Korea
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- Prof. Tae Young Kim, Gachon University, South Korea
- Prof. Krzysztof Koziol, Cranfield University UK
- Prof. Dong Ha Kim, EWHA Women University, South Korea
- Prof. Yun Suk Huh, Inha University, South Korea
- Prof. Jorge Pérez Juste, Universidad de Vigo, Spain
- Prof. Oula Penate Medina, Molecular Imaging North Competence Center, Kiel, Germany
- Prof. Ya Yang, Chinese Academy of Sciences, Beijing, China
- Prof. Richard Fu, Northumbria University, UK
- Prof. Miroslav Dramicanin, Vinca Institute of Nuclear Sciences, Belgrade, Serbia
- Prof. Valentina Utochnikova, Lebedev Physical Inst. of the Russian Academy of Sciences, Moscow, Russia
- Prof. V. A. Moshnikov, Petersburg State Electrotechnical University, Saint Petersburg, Russia
- Dr. Maria Vasilopoulou, National Center for Scientific Research Demokritos, Athens, Greece
- Prof. Sylvia Draper, Trinity College, Dublin, Ireland
- Prof. Isodiana Crupi, University of Palermo, Italy
- Prof. Guenter Huber, University of Hamburg, Germany
- Prof. Roman Krahne, Istituto Italiano di Tecnologia, Genoa, Italy
- Prof. Graziella Malandrino, University of Catania, Italy

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Deadline for abstract submission: **20th May, 2019**

www.european-mrs.com

Introduction and scope:

The topic of the symposium are caloric materials and their related phenomena. This timely topic is currently attracting a considerable attention of the worldwide scientific community due to their great potential for new environmental-friendly cooling applications in wide market niches ranging from microelectronics to macro cooling devices.

Caloric effects stand for one of the main fields of research regarding solid state cooling. The caloric effect are either magnetocaloric (MC), electrocaloric (EC) or mechanocaloric (mC) – where the material of interest entropy changes under the application of external stimuli – magnetic, electric, or mechanical, respectively. For example, in EC cycle, a dipolar system such as ferroelectric material is used in the cycle instead of gas medium that is usually harmful for environment. Electric field plays there the role of pressure. However, caloric materials still exhibit many drawbacks (for example effect not large enough or costly materials) that need to be overcome before they can be considered in commercial devices. Besides the design and development of such devices is crucially needed. Moreover, the underlying mechanisms of these effects are still not fully understood, which means that thorough theoretical approaches (including first and second principles) are required. Studies on MC, EC and mC materials have mostly been carried out by different communities so far. For example, the MC community is traditionally involved in other magnetism-related fields while the EC researchers more often come from the world of ferroelectric ceramics. This symposium will join together three communities, all working on caloric materials for cooling applications, but presently not very well connected. The speakers will discuss caloric effects including multicaloric, inverse caloric, giant phenomena, among others, in crystals, ceramics, thin films, soft (polymers, liquid crystals) or organic materials and their integration for applications.

Hot topics to be covered by the symposium:

MC, EC and mC materials and devices, multicaloric effect, inverse caloric effect, soft and solid caloric materials, theoretical approaches for understanding the underlying mechanisms in calorics, coupling of caloric phenomena with other effect in materials, prototypes.

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Introduction and scope:

Energy consumption and data storage limit the development of modern electronics. This motivates the search for alternative ways of information processing. Bioinspired electronics based on non-volatile memory devices is most promising. Various materials, technologies and computational schemes can be used for implementing artificial synapses and neurons in so-called neuromorphic networks.

Neuromorphic engineering exploiting non-volatile memory (NVM) devices, or in general memristive systems), has enormous potential for highly energy-efficient cognitive electronics being clearly superior to state-of-the-art computing architectures in terms of data- and energy consumption. To mimic the role of synapses in the nervous systems and the stochastic and non-linear characteristics of neuronal units, a large number of materials and device structures are investigated for neuromorphic systems. Furthermore, a variety of different computational approaches is already presented taking into account the special properties of those devices and various architectures, also exploiting hybrid CMOS-NVM systems. For example, the binary On/Off switching behavior, as explored in Conductive-Bridging RAM (CBRAM) or Magnetic RAM devices can be used to emulate synaptic functionality. Phase Change Memory (PCM) or Resistive-RAM (RRAM), are as well highly employed to reconstruct phenomenological substitutes of synapses for neural networks. Furthermore, the inherent stochasticity and multilevel, or analog, capability of some NVM devices are used to emulate synaptic learning and memory processes. However, in order to realize powerful neuromorphic electronics, an interdisciplinary approach is needed that ranges from the investigation of material properties, through the realization of functional devices, to novel computing and circuit schemes. In order to maintain this interdisciplinary, an intensive exchange of scientists with very different expertise is required. This includes experts in the field of novel materials, analytics and measurement methods, as well as device experts, developers of computational and biological modeling, circuit designers and experts in the field of complex dynamic systems. Therefore, the symposium seeks to provide the framework for an interdisciplinary exchange of scientists from those various fields.

Hot topics to be covered by the symposium:

- Physics and technology of memristive nanomaterials and devices
- Stochastic phenomena in memristive materials
- Engineering of different technologies devices (RRAM, CBRAM, MRAM, FeRAM, PCM) for spiking neural networks
- Devices to emulate the synaptic or neuron functionality
- Emerging materials and concepts for neuromorphic computing: 2D materials, organic synaptic devices, optical switching
- Design and modelling of neuromorphic computing systems
- Bio-hybrid network
- Organic Electronics for Neuromorphic Computing
- Photonic neural networks

Scientific committee members:

- Ming Liu (IMECAS, China)
- Stefano Brivio (CNR-IMM, Italy)
- Gang Niu (Xi'an Jiatong University, China)
- Hangbing Lv (CAS, China)
- Jinfeng Kang (Peking University, China)
- Doo Seok Jeong (Hanyang University, Seoul, South Korea)
- Enrique Alberto Miranda (UAB, Spain)
- Christophe Vallee (LTM, France)
- Julie Grollier (CNRS-Thales, France)
- Lambert Alff (TU Darmstadt, Germany)
- Gennadi Bersuker (Aerospace Corporation, USA)
- Regina Dittmann (FZ Juelich, Germany)
- Praneef Adusumilli (IBM, USA)

Symposium Organizers:**Christian WENGER**

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Deadline for abstract submission: **20th May, 2019**

www.european-mrs.com

Introduction and scope:

The continued evolution of diamond growth and technology has led to new opportunities in detectors, high power and high voltage electronics, superconductivity and quantum photonics. This has been strongly driven by advances in the growth technology such as high purity and now large area substrates becoming commercially available.

Several topics will be of particular interest at this meeting, although papers on all aspects of diamond technology are welcome. These include diamond for power electronics, diamond nano-electronic devices, diamond for quantum applications and diamond for bio-devices. In all cases, man-made single crystalline diamond is used either as ultra-pure layer or semiconducting by boron and phosphorus doping. The growth and deposition of high quality diamond films will therefore be a subtopic at the symposium. Quantum metrology applications (for example, magnetometry based on NV centres) is of key interest. Doping of diamond is a key topic using both boron and phosphorus. In case of phosphorus and boron doping. New areas such as the integration of diamond GaN, Wafer bonding to materials will be given close attention.

Hot topics to be covered by the symposium:

- Wafer bonding of diamond to electronic materials
- Growth of high purity diamond
- Doping of diamond
- Polishing and low damage removal of material
- Biological interaction with diamond surfaces and devices
- Surface functionalisation
- Single Photon Sources (NV, SiV etc)
- Superconductivity and superconducting devices
- Micro and Nano – Electromechanical Systems
- Diamond RF and power devices

List of invited speakers:

- Yamaguchi Takahide (National Institute of Materials Science, Tsukuba, Japan)
"Field effect transistor based on diamond/h-BN heterostructures"
- Mete Atature (University of Cambridge, UK)
"Strain manipulation of SiV colour centers in diamond"
- Richard Jackman (University College London, UK)
"Diamond nanowires with ballistic transport and their use for the first diamond FIN-FET technology"
- Gavin Morley (University of Warwick, UK)
"Levitated nanodiamonds towards fundamental physics"
- David Eon (Institut Néel, Grenoble, France)
"Diamond Schottky diodes parallelization for high current"
- David Moran (University of Glasgow, UK)
"Progress in the development of transfer-doped H-diamond devices for high frequency, high power and high temperature applications"
- Thomas Gerrer (Fraunhofer Institute for Applied Research, Germany)
"Direct bonding of gallium nitride thin-film transistors onto diamond substrates"
- Anke Krueger (Bavarian University of Würzburg, Germany)
"Synthesis and in-depth characterization of highly fluorinated diamond surfaces"
- Lionel Rousseau (ESIEE Paris, France)
"Full diamond implants, a new approach for chronical in-vivo applications"

Scientific Committee members:

- Prof. Ken Haenen, Hasselt University, Institute for Materials Research (IMO) & Division IMOMEC, Belgium
- Prof. Paul May, School of Chemistry, University of Bristol, UK
- Prof Ian W. Boyd, Brunel University, Uxbridge, UK
- Prof. Julien Pernot, Université Joseph Fourier, Grenoble, France

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Deadline for abstract submission: **20th May, 2019**

www.european-mrs.com

Introduction and scope:

The symposium aims to discuss on the recent advances on novel materials for integrated optics. That includes a large variety of materials: oxides, chalcogenides, polymers, Diamond, 0D, 1D and 2D nanomaterials... and their monolithic or hybrid integrations with more standard photonics platforms (Si, Ge, III-V).

Photonics is one of the key enabling technologies with a broad scope of applications including on-chip optical communications, sensing, quantum and security to name few.

For several years, the progresses of photonic integrated circuits have been governed by the development of passive and optoelectronic devices based on III-V and Si materials. The future evolution of integrated circuits aims at reaching higher performances in terms of power consumption, efficiency, footprint and speed, which opens new opportunities for the integration of new materials with exceptional optical properties. New challenges on light-matter interactions and optical integration for large-scale manufacturing have also to be addressed that will rely on the development of new concepts using novel materials with tailored optical properties.

A large variety of efficient optical materials including functional oxides, Mott insulators, ferroelectrics, chalcogenides, polymers, carbon based materials (Diamond, carbon nanotubes, graphene), 0D, 1D and 2D nanomaterials can be considered which all will find a perfect showcase in the framework of this symposium.

The symposium aims to gather experts working at the theoretical and experimental level on the development of novel material for integrated photonic applications.

The scope includes a large range of topics: basic physics, devices, integration, material growth, modeling and emerging waveguiding structures.

Hot topics to be covered by the symposium:

- Epitaxial growth of new optical materials
- Materials for photonics
- Functional oxides
- Ferroelectrics
- Mott insulators
- Doped polymers and oxides
- Nanomaterials
- Chalcogenides
- Integrated photonics platform
- Nonlinear optical properties
- Pockels effect
- Kerr effect
- Devices
- Sources
- Optical modulators and switches
- Detectors
- Hybrid integration in silicon photonics platform

Scientific Committee members:

- Prof. Roel Baets - Ghent University (Belgium)
- Prof. Benoit Cluzel - Université de Bourgogne (France)
- Prof. Catherine Dubourdieu - Helmholtz Zentrum Berlin für Materialien und Energie (Germany)
- Prof. Sasan Fathpour - CREOL, The College of Optics & Photonics (USA)
- Dr. Arianna Filoramo - CEA Paris-Saclay (France)
- Prof. Massimo Gurioli - Università degli Studi di Firenze (Italy)
- Prof. Zhipei Sun - Aalto Univ. (Finland)
- Dr. Bertrand Szegal - CEA-Leti (France)
- Hon Ki Tsang - The Chinese University of Hong Kong (Hong-Kong)

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Introduction and scope:

Fifty years ago, it was forecast that our modern society would be supported and operated mainly by three elements of technology; i.e. materials, energy and information. Rapid rise in the research and development of new materials has not only largely improved our modern life but also controls further expansions of the other two technologies. The research of materials, such as more efficient batteries and light chemical energy conversion materials, is urgently required. Our symposium will be one such attempt in the field of energy research with focus on materials for Batteries and Solar cells.

The growth of the human population coupled with the simultaneous improvement of living conditions is resulting in a rapidly rising global energy demand, and the negative effects on the environment in the form of pollution and global warming are becoming ever more apparent. Therefore, it is of utmost importance to take action now and concentrate on an active search for alternatives to our current fossil fuel based economy. The general consensus is that only renewable energies could provide a long-term sustainable source of energy. One needs, however, to consider that if fossil fuel is taken out of the picture, one requires an adequate substitute energy carrier for mobile applications (cars, planes, etc.). Our symposium will focus on novel materials that have attracted the focus of the scientific community in the vast field of energy materials. The applications of such materials will be having a broad view in the area of solar cell, Battery, super capacitor, thermoelectrics, and fuel cells. Scientists doing their research in all the above area will be getting a common platform to showcase their latest findings, which all will be attached through a common string named Energy. For example, rechargeable batteries have become an indispensable part to facilitate a sustainable utilization of renewable energies in the prevalent form of Li-ion batteries. However, it leads to increasing concerns regarding its sustainability due to the limited resource and consequent price increment of lithium. Owing to more abundance and lower cost of sodium (Na), Na-ion batteries (NIB) have sparked the scientific attentions as a promising next generation alternative, in particular, for middle- to large-scale grid energy storage. This could be clearly reflected by a recent prediction of a global market expansion for NIB from \$420 million in 2017 to \$1.2 billion by 2020. For this reason, increasing efforts have been devoted to explore a better NIB that could fulfill the restrictive requirements of energy density, safety, costs, and sustainability. Another example, for the super capacitors, the range of topics will include capacitor performances for power uses such as electric vehicles, energy back-up applications, and renewable energy storage systems.

Materials (such as, including but not limited to carbonaceous materials, intercalation compounds, metal oxides, nitrides, molybdates, phosphates, polymers and other composites) for electrochemical double layer, hybrid, redox, symmetric and asymmetric capacitor systems will also be included. The symposium will be a mixture of theory and experiments with a strong view of bridging the gap between them.

Hot topics to be covered by the symposium:

- Oxide materials and their application in energy research
- Two-dimensional materials for energy production and storage
- Perovskite based materials for solar cells
- Novel materials for enhance battery performance
- Materials for super Capacitor Technology
- Thermoelectrics

Symposium Organizers:**Rajeev AHUJA (CHAIR)**

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Deadline for abstract submission: **20th May, 2019**

www.european-mrs.com

Introduction and scope:

The topic of this proposal is to display recent advances in computational materials science in the area of water splitting. The aim is to highlight synergy opportunities in methodologies with special emphasis on multi-scaling approaches. The ultimate goal is applying the state-of-the-art methods to model earth abundant nanocrystals.

Modern society needs a source of energy generated without harming the environment. The efficiency of devices converting renewable energy by processes such as water splitting relies on a sensible choice of material components. However, larger scale material and device properties such as interface segregation, grain boundary movement, ionic diffusion through porous materials and mechanical loading also strongly impact performance, making the theoretical simulation of realistic devices a challenging multi-scale problem. Although the scientific community has developed expertise in different fields focusing on a range of length and accuracy scales, much less effort has been devoted to integrating and combining these models towards a true multi-scale approach. The ultimate central challenge will be to generate a multiscale modelling platform that will be used world-wide for conducting state-of-the-art multi-scale property prediction of materials. The symposium will broadly cover the current status of multi-scaling approaches, both in method development and application toward water splitting. It intends to focus on bridging the knowledge gaps between different theoretical methods and computer codes in order to facilitate the discovery of novel materials for energy conversion. The objectives of this symposium include building an organized network of scientists working on achieving greater scientific understanding of water splitting and developing approaches for reliable and realistic multi-scale modelling of nano-oxides material architectures. The long-term outcome will be more environmentally friendly energy technologies featuring immeasurably large impact and benefit for society.

Hot topics to be covered by the symposium:

- Computational material science multi-scaling approach and development
- Integration of quantum mechanics with molecular dynamics
- Overlap between quantum mechanics and monte carlo simulations
- Continuum models including microscale models
- Applications toward design of nano-crystals for water splitting

Symposium Organizers:**Maytal CASPARY TOROKER**

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Introduction and scope:

The Symposium focuses on new results about fabrication and performance of nuclear materials exposed to extreme conditions and radiation. This includes structural and fuel materials and their waste forms. A great emphasis is put on advanced approaches, such as experimental and computational multi-scale plus new fabrication techniques.

The science and engineering of nuclear materials, and especially radiation induced effects, is an active field of research. Many workshops and conference on the subject are therefore application-oriented with a certain lack in addressing basic principles. The scope of our symposium is to highlight basic theoretical and experimental principles, focusing on the fabrication of nuclear materials and to describe key mechanisms responsible for their aging and degradation under the given exposure. The main goal of the symposium is to review the latest progress and chart future advances in experimental and modelling multi scale approaches to describe the synthesis and the behavior of these solids under extreme environments like irradiation, mechanical/thermomechanical stress, high temperature and/or chemically reactive environment.

The symposium will address topics pertaining to nuclear structural materials and fuels, their fabrication and performance under nuclear reactor conditions, especially advanced systems with more demanding parameters in temperature, radiation dose and corrosion. Moreover, the behavior of the waste forms in the repository or alternatively the reprocessing of fuel will be treated. The addressed theoretical methods span many orders of magnitude from ab-initio up to the mesoscale size. The experimental approaches emphasize the role of advanced techniques, which will allow the understanding of basic processes in synthesis of materials or their degradation mechanisms contributing to the validation of modelling results. As a special form of the connection between experimental and computations methods, machine learning will also be addressed in the symposium.

Hot topics to be covered by the symposium:

Targeted materials/components

- Nuclear structural materials
- Nuclear fuels
- Nuclear waste forms

Scientific questions

- Synthesis of materials
- Multi scale modelling
- New experimental device
- New simulation tools

Methods

- Modelling from Ab-Initio to Mesoscale
- Advanced characterization techniques
- New fabrication techniques
- Machine learning

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Deadline for abstract submission: **20th May, 2019**

www.european-mrs.com

Introduction and scope:

Metal hydrides are of special interest for a diverse range of applications e.g. electrochemical, hydrogen, and thermal energy storage materials. The goal is to provide energy storage solutions for the intermittent renewable but sustainable energy production pathway for future generations.

The urgent need for energy storage materials for a sustainable and carbon-free society is the main stimulant for the new dawn in the development of metal hydrides in batteries, hydrogen storage materials and thermal energy storage. One application is batteries based on metal hydrides with alternative cations including Na⁺ and Mg²⁺, which are considered as cheaper, and more abundant, while potentially higher energy density compared to Li-ion batteries are achievable. Another application is to address the intermittent supply from renewable energy sources with a hydrogen-fuel cell system to provide an uninterrupted sustainable supply of energy for stationary systems and benign zero-emission vehicles, with clean water as the only reaction by-product. Renewable energy combined with efficient ways of energy storage will be a key enabler to future technologies. Metal hydrides clearly offer an attractive and versatile platform of materials, which encompass a broad array of structures and combine interesting and tuneable properties useful for a breadth of energy applications spanning from solid-state hydrogen storage, to solid-state ion conductors for batteries or fuel cells and thermal energy storage. The proposed symposium aspires to bring together ambitious young and established scientists from around the world to not only present the latest advances of the intense worldwide research but also exchange ideas as well as identify major challenges and hot-topics for future developments towards efficient solutions for energy applications.

Hydride materials display a broad range of chemical, structural and physical features. This diversity in turn yields an unrivalled breadth and scope of possible applications, particularly with the advent of nano-technological development. As such, the talks given by enthusiastic-young and world-leading researchers in this symposium are bound to captivate a wide audience.

Hot topics to be covered by the symposium:

- Fundamental hydride structures, reaction mechanisms and thermodynamics
- Fundamental aspects of solid state ion conductors
- Hydrides for battery electrodes and energy conversion
- Hydrides for solar thermal energy storage
- Hydrogen storage material development
- Computational methods for hydride materials
- Design and application of hydride based systems
- Towards application: sensors, batteries and engineering challenges

Confirmed Invited Speakers include:

- **Keynote Speaker:** Wolfgang Zeier (Justus-Liebig-University Giessen, Germany)
- Dorthe B. Ravnsbæk (University of Southern Denmark, Denmark) **Session 1.** Fundamental aspects of solid state ion conductors
- Claudio Corngnale (Greenway Energy, USA) **Session 3.** Hydrides for Solar Thermal Energy Storage
- Yaroslav Filinchuk (Université Catholique de Louvain, Belgium) **Session 4.** Hydrogen storage material development
- Sabrina Sartori (University of Oslo, Norway) **Session 4.** Hydrogen storage material development
- Pilar Ariza (University of Sevilla, Spain) **Session 5.** Computational methods for hydride materials
- Gavin Walker (University of Nottingham, UK) **Session 6.** Design and application of hydride based systems
- Leo Duchene (EMPA, Switzerland) **Session 7.** Towards application: sensors, batteries and engineering challenges

Joint Session with Symposium M (Metal oxide- and oxyhydride-based nanomaterials for energy and environment-related applications): Session 8. Advanced Characterisation Techniques for Energy Materials

Committee Members:

- Torben Jensen [Aarhus University, Denmark]
- Michel Latroche [Institut de Chimie et des Matériaux de Paris Est, France]
- Matteo Brighi [University of Geneva, Switzerland]
- Efi Hadjixenophontos [University of Stuttgart, Germany]
- Hai-Wen Li [Kyushu University, Japan]
- Inga Bürger [German Aerospace Center, Germany]
- Brandon Wood [Lawrence Livermore National Laboratory, USA]

Symposium Organizers:**Michael HEERE**

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Deadline for abstract submission: **20th May, 2019**

www.european-mrs.com

Introduction and scope:

Metal oxide and oxyhydride nanomaterials possess many technologically important properties that can be tuned by controlling the shape and size. The aim of the symposium is to bring academic scientists, engineers, and industry to exchange their results about latest developments on the topic.

Nowadays, nanomaterials are becoming commercialized. Current theoretical and experimental studies aim to further increase the impact that the nanomaterials can play in technological advances. In recent years, new materials and devices based on transition metal oxide and oxyhydride nanomaterials, and their hybrids with organic compounds have been developed that present interest for applications in energy storage, energy harvesting, energy saving, energy conversion, and environmental technologies. Furthermore, the recent years have seen the development and improvement in synthesis and characterization techniques, computational tools and software for simulation, data analysis and fitting. This Symposium will provide an overview of the state of the art and most recent scientific and technical progress as well as market situation, identification of key areas, challenges, approaches, and technologies in this field. The symposium is multidisciplinary. It covers new advances in metal oxide and oxyhydride nanomaterials development, 2D materials, theoretical and experimental methods of synthesis and characterization. Transition metal oxides such as, e.g., Ga₂O₃, SnO₂, GeO₂, TiO₂, SiO₂, Bi₂O₃ etc., rare earth metal oxides such as, e.g., CeO₂, Gd₂O₃, Dy₂O₃, etc., transition metal oxyhydrides such as e.g., LaHO, ABO₃-xH_x, YHO, GdHO, DyHO, etc will be under the focus of the Symposium along with the life cycle assessment, eco-toxicological assessment, risk assessment, influence of the particles on human health, applications in environmental technologies, energy production, energy storage, and energy saving.

Hot topics to be covered by the symposium:

- Metal oxide-based nanomaterials
- Transition metal oxyhydrides
- 2D materials
- Defects and impurities, functional properties and new phenomena
- Theoretical and experimental methods of research
- Applications of the nanomaterials in:
 - a) energy conversion devices
 - b) energy storage devices (batteries and super-capacitors),
 - c) power electronics
 - d) environmental applications (sensors, waste water treatment, air cleaning, photocatalytic processes)
 - e) superhydrophobic, anti-ice, anti-dust coatings
 - f) medicine and biotechnology
- Life-cycle assessment
- Risk assessment

List of invited speakers:

- Kageyama, Hiroshi, Kyoto University, Japan.
- David Rogers, Nanovation SARL, France.
- Sanjay Mathur, Institute of Inorganic Chemistry University of Cologne, Germany.
- Su Huai Wei, Beijing Computational Science Research Center, China.
- Max Wolff, University of Uppsala, Uppsala, Sweden.
- Pooi See Lee, Nanyang Technological University, Singapore.
- Giancarlo Salvati, Institute of Materials for Electronics and Magnetism IMEM. Institute of Materials for Electronics and Magnetism IMEM, Rome, Italy.
- Bernt Thorstensen, Keranor AS, Oslo, Norway.
- A. Subrahmanyam, Indian Institute of Technology Madras, Chennai, India.
- Aleksandra Djuricic, University of Hong Kong, Hong Kong.
- Marco Altomare, Friedrich-Alexander Universität Erlangen-Nürnberg, Germany.
- S. Balakumar, University of Madras, Chennai, India.
- Neslihan Yuca, ENWAIR AS, Istanbul, Turkey.

List of scientific committee members:

- Malle Krunks, Tallinn University of Technology, Tallinn, Estonia.
- Luminita Andronic, Transilvania University of Brasov, Brasov, Romania.
- Darius Milcius, Lithuanian Energy Institute, Kaunas, Lithuania.
- Jose Montero, University of Uppsala, Uppsala, Sweden.
- Esra Ozkan Zayim, Istanbul Technical University, Istanbul, Turkey.
- Vishnukanthan Venkatachalapathy, University of Oslo, Oslo, Norway.

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Deadline for abstract submission: **20th May, 2019**

www.european-mrs.com

Introduction and scope:

Catalysts are widely used to lower thermodynamic barriers and accelerate kinetics of reactions in many (photo)electrochemical energy conversion processes. The past few years have witnessed a rapid growth in catalytic materials research. This symposium aims to bring together researchers who are interested in, and actively working on, catalytic materials and processes for use in (photo)electrochemical energy conversion.

With the ever-growing deployment of renewable energy and the needs for load-levelling, rapid inter-conversion of electrical energy to chemical energy and vice versa provides an attractive solution to off-peak renewable energy storage and utilization. Using electrolyzers, water can be split producing hydrogen fuels that are clean and high-density energy carriers. Photoelectrochemical (PEC) water splitting using semiconductor photoelectrodes, including multi-junction architectures, offers a straightforward and potentially efficient means of hydrogen production, though formidable challenges for stable and un-assisted water splitting still remain and practical deployment of PEC cells may take a few decades. Electro-fuels, i.e. chemicals produced by electrolyzers, have recently provoked increasing interest: a great deal of work on electrocatalytic and photoelectrocatalytic CO₂ reduction has been reported, and electrosynthesis of ammonia has lately emerged as an alternative to the energy-intensive Haber-Bosch process. As far as fuel cells are concerned, several European countries have announced a timetable for stopping the production and sales of petrol and diesel powered cars. This will open up a huge market for fuel-cell powered vehicles.

To achieve high conversion efficiency, the use of catalysts in (photo)electrolyzers and fuel cells is essential. Remarkable progress has been made in recent years towards the development of new catalytic materials, with particular emphasis on the substitution, either partially or completely, of precious noble metals. Recent advances in in-operando characterization techniques, as well as in theoretical approaches to the prediction of activity trends and catalyst screening allow for fundamental understanding of catalytic mechanisms and processes and rational design of efficient and durable catalytic materials.

This symposium will provide a platform for researchers working on catalytic materials to showcase and learn about the latest findings in this fast-growing field of research. The symposium covers, but is not limited to, both experimental and theoretical studies of advanced catalytic materials that can find applications in fuel cells and electrolyzers of different types. Contributions to the system design of these (photo)electrochemical energy conversion devices are also welcome.

Hot topics to be covered by the symposium:

- Water splitting and fuel cell catalysts
- Semiconductor materials including multijunction/hybrid photoelectrodes
- Electrochemical and solar-driven CO₂ reduction
- Catalytic materials for electro-fuel and chemical (e.g. methanol, ammonia) synthesis
- 2D materials for (photo)electrocatalysis
- Bi-functional and multi-functional electrocatalysts
- Reduction/replacement of critical metals by nano-design of abundant materials
- Theoretical and experimental approaches to catalyst screening and design
- Advanced characterization techniques (in particular in-operando) of photoelectrodes and catalysts
- Theoretical studies and computational modeling of catalytic mechanisms/processes

List of Invited Speakers (in alphabetical order):

- Christian Hess – Technical University of Darmstadt, Germany
- Foteini Sapountzi – Syngaschem BV, Netherlands
- Gongxuan Lu – Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences, China
- Hua Zhang – National University of Singapore, Singapore/City University of Hong Kong
- Ib Chorkendorff – Technical University of Denmark, Denmark
- Jingshan Luo – Nankai University, China
- Juan Ramon Morante – Catalonia Institute for Energy Research (IREC), Spain
- Ki Tae Nam – Seoul National University, South Korea
- Laasonen Kari – Aalto University, Finland
- M. M. Shaijumon – Indian Institute of Science Education and Research Thiruvananthapuram, India
- Neil V. Rees – University of Birmingham, UK
- Xiangdong Yao – Griffith University, Australia
- Wolfram Jaegermann – Technical University of Darmstadt, Germany

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- Ifan Stephens – Imperial College London, UK
- Marc Heggan – Forschungszentrum Juelich, Germany
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- Mingkui Wang – Huazhong University of Science and Technology, China
- Xiaojun Wu – University of Science and Technology of China, China
- Yujie Xiong – University of Science and Technology of China, China
- Yung-Jung Hsu – National Chiao-Tung University, Taiwan
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Deadline for abstract submission: **20th May, 2019**

www.european-mrs.com



Introduction and scope:

Green strategy for material recycling opens the way for circular economy and new industrial processes; however, the pillars of this challenge are the strategic materials, the carbon cycle and the water consumption.

One of the new challenge is to develop circular economy for each kind of materials, however we can distinguish the byproducts of the process from the mine to the elaborated material and the deconstruction of each kind of product at the end of its life.

Generally in a thermodynamic strategy we speak of enthalpy and entropy, the second one take into account the mass balance and the energy balance of the byproducts and permit an optimization of the process.

Today we mix to kind of proposals the mass balance with the material recycling and the byproducts, and the energy balance with the carbon energy efficiency that is why the question of the carbon content seems to be a strategic parameter to evaluate each kind of process.

However, the question of the carbon taxes (ETS) through the international trading system is the hidden parameter of the black box. For the waste treatment without international references in the stock exchange, and an anarchic environmental rules any kind of economical simulation processes does not take care of the waste treatment and the carbon emission. The economic optimization as we see around the world consist of Stockpiling waste for the next generation.

If we modify the paradigm and qualify the waste as a field of raw materials or a storage of energy we can open a new engineering research strategy and develop new education proposals.

In front of us we have the recycling of electronic materials from computers, mobile phones, the recycling of batteries, the recycling of rubber from tires, the recycling of rare earths from magnets, the polymers recycling, the zinc and copper from electronic hardware. But today we have no rules for an industrial recycling with specific processes which probably need more dry techniques, including innovative approaches, to replace wet dirty processes.

One of the question behind the recycling and the mineral extraction is the amount of waste produces during the treatment. But e-waste recycling creates new opportunities, as the waste provides a higher concentration of metals higher than in the mined ore. However waste is also mixed with other materials and compounds so new processes are needed and new co-products could also be generated, which could be harnessed under well-defined recycling pathways.

To open a new symposium we can suggest two main ways one about a critical value-added material and a second one about carbon dioxide emission from the processes but in every case we have to point out the byproducts and the water consumption.

At the same time we have to point out the environmental risks of waste transformations into value-added materials which are more complex than the usual materials. Because some mixtures contain a variety of materials with many possible outcomes and need specific rules or new processes and open the question of new researches, new industrial techniques, which are the goal of a more safe and sustainable world.

Today waste or end-of-life products from many industries and other sources could reach those countries where the environmental rules and the human risks are not taken into account, and in doing this through unfortunate circumstances way we produce geopolitical conflicts, water pollution and toxic air emissions.

Under the umbrella of UNESCO for the education and the ONU for the international trade it seems that an international agreement is needed to manage recycling, waste treatment and circular economy needed with an increasing world population.

Hot topics to be covered by the symposium:

- First balance of the main waste material production including the carbon ones
- Management tools for the waste control for materials (toxicity, time life, European directives)
- Waste transformations and material recycling for electronic, batteries, glasses, polymers, magnets and harmful materials to regenerate valuable materials and develop new technologies for selective synthesis of materials from waste through microrecycling.
- Bacteria processes for new extraction from deep field and carbon loop
- Innovative processes for turbine efficiency
- Circular economy and waste: how to manage the new wastes, and build on the new science of microrecycling

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Deadline for abstract submission: **20th May, 2019**

www.european-mrs.com

Introduction and scope:

3D printing and additive manufacturing processes are of strategic importance for the industry of the future. This is the reason why our symposium is expected to cover the most innovative 3D fabrication techniques able to respond to the future market. A special attention will be given to the processes hybridation especially regarding economical and industrial aspects.

The symposium will cover the most innovative 3D manufacturing processes for the industry of the future as detailed in the following list :

- DED – CLAD powder deposition induced by laser fusion
- Solidification of powder under the action of a laser and electron Beam (EBM) on various materials : Metal, ceramic, composites, Polymer, and Sand
- Assembly of layers from plates: Stratoconception® (wood, polymer, metal)
- Laminated Object Manufacturing (LOM)
- Polymerization of a resin under the action of a laser: Stereolithography, Digital Light Processing (DLP)
- Material Jetting 3D Printer: Polyjet
- 3D laser micro and nano texturation of surfaces by combining subtractive and additive processes

Hot topics to be covered by the symposium:

3D printing and additive manufacturing of metals, ceramics and polymers are able to deliver tailored products with customized geometry and physical properties. These fully scalable processes offer cost-effective solutions for producing both small and large objects of different materials on a large scale in order to respond to the new market demands. The global 3D printing market is expected to reach \$21 billion by 2020 — quadrupling its size in just four years. While 3D printing, also referred to as additive manufacturing, comes with many benefits, such as freedom of design, easy prototyping, customization and streamlined logistics, it also poses many challenges both from scientific and technological point of view, which will be covered by this symposium.

Tentative list of invited speakers:

- Sebastian BREMEN (ILT, D): Component and system development for selective Laser melting
- Philippe BAUER, (Thales Global Services, F): Mechanical modeling and additive fabrication
- Michel BELLET (CEMEF MinesParisTech, F): Numerical simulation applied to additive fabrication
- Alain BIERNEAUX (OPTEC SA, B): Recent advances in industrial laser systems for 3D printing and additive manufacturing
- Pierre DUYINX (University of Liège, B): Topological optimization in additive fabrication
- Anath FISCHER (Technion, IL): Advanced methods for reconstruction of 3D objects
- Arthur LEIS, (IFSW, D): Innovative aspects of laser Additive Manufacturing
- Filomeno MARTINA, (Cranfield University, GB): New advanced wire and arc additive manufacturing process
- Vojislav PETROVIC, (AIMEN, SP): Additive Manufacturing Solutions for Improved Medical Implants
- Arnaud SPANGENBERG, (IS2M, F): Micro / Nanofabrication additive by biphotonics photopolymérisation

Tentative list of scientific committee members:

- Yves BELLOUARD (EPFL, CH)
- Philippe BERTRAND (ENISE, F)
- Andres GASSER (ILT AACHEN, D)
- Thomas GRAF, (IFSW, D)
- Patrik HOFFMANN (EMPA, CH)
- Cyril PELAINGRE (CIRTES, F)
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- Patrice PEYRE (Arts et Métiers ParisTech, F)
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Deadline for abstract submission: **20th May, 2019**

www.european-mrs.com

Introduction and scope:

Recent advances in the synthesis of nanoparticles, and in atomic-scale characterization, coupled with insights from theoretical modelling, have opened exciting possibilities to tailor nanoparticles for many applications, such as catalysis, plasmonics, sensors, magnetism, and biomedical applications.

Nanoparticles are attracting much interest for both fundamental scientific reasons as well as for practical applications. In studying their fundamental properties, chemist, physicists, and materials scientists meet. Their properties are strikingly different from those of the corresponding macrocrystalline materials, and based on that applications can be found in fields as diverse as biomedical applications, environmental sciences, optics, electronics and catalysis. Important recent progress is due to advances in controlled assembly of nanoparticles, both by wet-chemical as well as by physical preparation techniques, impressive progress in the resolution of characterisation techniques, offering more and more the possibility to study the formation and functionality of these nanoparticles in situ, coupled to important developments in the field of computational chemistry and physics, allowing to increasingly understand the fundamental basis of their properties.

This symposium builds on last years success and will bring together again leading experts on advanced techniques for nanoparticle synthesis, in order to promote cross fertilization and to inspire progresses in the control of nanoparticle size, shape, composition and functionalization as well as in the fabrication of nanoparticles with controlled morphological morphologies and composition. Characterization techniques with high spatial resolution, spectroscopic capability and chemical sensitivity are an essential tool not only to investigate the output of the synthesis procedures but also to elucidate the structure-property relationships of these particles. This interdisciplinary forum will be completed by the participation of renowned experts in theoretical modelling and simulation of NPs structure and properties, which is of paramount importance both for understanding atomic and electronic structure and to predict non-trivial unexpected behaviour and new phenomena. The symposium will include also a few selected experts on functionality and practical applications of these nanomaterials. Given the "hot topic" nature of the symposium and the unique interdisciplinary discussion opportunities it will provide, we expect a numerous and high quality attendance.

Hot topics to be covered by the symposium:

1. Recent development in nanoparticle synthesis techniques
 - Wet-chemical : colloidal preparation, emulsions, impregnation
 - Gas phase preparation : ALD, spark discharge, size-selected nanoclusters
 - Lithography
2. Structural / chemical analysis of nanoparticles
 - Electron microscopy : high resolution/in-situ/acquisition and detection methodology
 - Advanced spectroscopy
 - Advanced diffraction and scattering techniques
3. Theoretical modelling of nanoparticles
 - Atomic ordering and electronic structure
 - Dynamical processes, excitations, reactions
4. Applications of nanoparticles
 - Structure-property relationships
 - Theoretical predictions vs experiment
 - Optical, catalytic, electronic, magnetic, sensing, biomedical

Symposium Organizers:

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Deadline for abstract submission: **20th May, 2019**

www.european-mrs.com

Introduction and scope:

Due to their particular surface properties, diamond films and nanocarbon materials (nanodiamonds, carbon nanotubes, fullerenes, graphene, and carbon dots) are widely investigated in applications fields for energy storage and conversion as well as nanomedicine. This symposium focuses on the surface and interface properties of these nanocarbon materials in relation with these applications.

Nanostructures of the carbon family (nanodiamonds, carbon nanotubes, fullerenes, graphene, and carbon dots) behave common surface properties which justify their wide use in energy or biomedicine fields. Nevertheless, some surface assets are nanocarbon dependent versus the sp² or sp³ carbon hybridization. Moreover, for a given nanocarbon, the surface chemistry is often a key which governs its properties in colloids or composites. For example, the electronic surface structure of nanodiamonds can be tuned to confer photocatalytic or radiosensitization properties.

This symposium aims to address surface and interface properties of nanocarbons. This topic includes their surface chemistry and new experimental tools to control it. In addition, the goal is also to illustrate the relationship between specific surface properties of nanocarbons and their applications in the fields of energy and biomedicine.

Surface chemistry includes surface terminations, sequential reactions, immobilization of molecules, genes and drugs, polymer grafting, physical and mechanical properties, simulations, and theory. Special attention will be drawn to the relationship between surface chemical structure and physical properties of carbon materials, and the actual techniques to control the surface chemistry. The structural characterization by spectroscopies and other means is one of the important subjects in this symposium. Advanced new experimental tools to investigate surface and interfaces of nanocarbons, especially reactions at the interface with solvent are concerned.

Hot topics to be covered by the symposium:

- Surface modifications of carbon materials and surface chemistry
- Interactions between nanocarbons and solvent in colloids
- Advanced experimental tools for surface and interface characterization of nanocarbons
- Solution-processed chemistry of carbon materials
- Theory and simulation in surface chemistry of nanocarbons
- Adsorption of molecules to carbon surface
- Surface effects on photoluminescence
- Hybridized carbon materials
- Electro- and bio-chemical applications of carbon materials
- Biomedical applications of nanocarbons
- Nanocarbons for energy storage and conversion
- Nanocarbons as non-metal catalysts
- Carbon material-based sensors

Confirmed invited speakers:

- M Aadel (Free University of Berlin & Lorestan University, Iran)
"Polymer-functionalization and bioapplication of graphene and CNTs"
- Y Chen (The University of Sydney, Australia)
"Antibacterial activity of nanocarbons"
- P Colavita (Trinity College Dublin, Ireland)
"Nanocarbon for water electrolysis"
- T Da Ros (Trieste University, Italy)
"Grafting of carbon nanotubes for biomedical applications"
- T Kondo (Tokyo University of Science, Japan)
"Diamond electrodes for electrochemistry"
- C Ménard Moyon (Strasbourg University, France)
"Physically-triggered nanosystems based on two-dimensional materials for cancer theranostics"
- P Pauzauskie (University of Washington, Seattle, USA)
"Chemical routes of SiV color centers production in diamond anvil cell synthesis of nanodiamond"
- T Petit (HZB, Germany)
"Interactions between nanocarbons and solvent molecules in colloids"
- S Sotoma (Osaka University, Japan)
"Fluorescent nanodiamonds for bioimaging applications"
- A Vul (Ioffe Institute, Russia)
"Transition sol-gel in nanodiamond hydrosols"
- Q. H. Yang (Tianji University, China)
"Nanocarbons for lithium capacitors"

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Introduction and scope:

This symposium will focus on the characterization of catalytically- and electrochemically- relevant interfaces by means of in situ and operando spectroscopies. Recent advances in the use of single and combined spectroscopic methods (photoemission, absorption, IR, Raman, etc.) will be presented and perspectives will be discussed.

Interfaces are of fundamental importance to understand the behavior of catalytic and electrochemical materials under reaction conditions. Spectroscopic methods are often used to investigate such materials because they allow qualitative and/or quantitative characterization under reactive environments without perturbing the reaction. Among them, synchrotron-based techniques, such as absorption, emission and photoemission spectroscopy, and "laboratory-based" techniques, such as Infrared and Raman spectroscopy, have been developed. By means of such techniques it is possible to obtain an in situ characterization of a material, that is, exposing it to a reactive environment under realistic working conditions while simultaneously acquiring information about the evolution of its physical-chemical and morphological properties. At the same time, operando measurements, carried out on materials undergoing a reaction while measuring the catalytic activity/selectivity and product pattern, are extremely useful to determine the structure-chemical composition-reactivity relationships. The main goal of this symposium is to merge the research communities investigating catalytic and electrochemical interfaces with different in situ/operando spectroscopic techniques to share and discuss recent results, methods and perspectives. The development of time- and space-resolved in situ/operando spectroscopic investigations will also be a paramount topic. The symposium will be a unique opportunity to foster the collaboration among groups having different expertise, to attract potential users developing materials whose novel properties need to be characterized, and to introduce recently developed experimental setups employing more than one spectroscopic method at the same time.

Papers focused on the investigation of catalytic and electrochemical interfaces by means of in situ and operando spectroscopic methods are invited and will be published in a special issue of "Catalysis Today".

Hot topics to be covered by the symposium:

- In situ and operando spectroscopic investigation of reactive interfaces (XPS, XAS, XES, IR, Raman)
- Time and space-resolved spectroscopic investigation of reactive interfaces under realistic working conditions
- Development of new in situ and operando spectroscopic methods
- Development of new experimental setups employing more than one spectroscopic method for the in situ and operando investigation of reactive interfaces (both laboratory- and synchrotron-based).
- Operando spectroscopic techniques as high-throughput materials research boosters

List of invited speakers:

- Prof. Dr. B. Weckhuysen (University of Utrecht, Utrecht, The Netherlands), B.M.Weckhuysen@uu.nl
- Dr. Junko Yano (LBNL, California, U.S.A.), JYano@lbl.gov
- Prof. Dr. Miguel A. Bañares (Instituto de Catalisis, CSIC, Madrid, Spain), miguel.banares@csic.es
- Prof. Dr. Ib Chorkendorff (Technical University of Denmark, Kongens Lyngby, Denmark), ibchork@fysik.dtu.dk
- Prof. Dr. Zhi Liu (ShanghaiTech University, Shanghai, China), liuzhi@shanghaitech.edu.cn
- Dr. Anja Bieberle (Dutch Institute for Fundamental Energy Research, Eindhoven, The Netherlands), A.Bieberle@diffr.nl

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- Prof. Dr. Jeroen van Bokhoven (ETH Zurich – PSI Villigen, Switzerland)
- Dr. Robert Weatherup (The University of Manchester at Harwell, U.K.)
- Dr. Ashley Head (Center for Nanoscience and Nanomaterials, LBNL, U.S.A.)
- Dr. David Starr (HZB, Berlin, Germany)
- Prof. Dr. Ian Sharp (WSI – TUM, Munich, Germany)
- Prof. Dr. Georg Held (University of Reading, Diamond Synchrotron, UK)
- Dr. Luca Gregoratti (Elettra Synchrotron, Italy)
- Prof. Dr. Karin Föttinger (TU Wien, Austria)
- Dr. Giovanni Agostini (ALBA Synchrotron, Barcelona, Spain)
- Dr. Andrea Zitolo (SOLEIL Synchrotron, Paris, France)
- Dr. Patricia Conception (Spanish National Research Council, Spain)

Sponsors:

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SPECS™

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Deadline for abstract submission: **20th May, 2019**

www.european-mrs.com

Introduction and scope:

This symposium is focused on the impact of nanoscale on thermal transport properties and their consequences on thermodynamic quantities, in particular temperature, maximum output power and conversion efficiency. It is now understood that the dynamics of energy carriers is governed by distributions of mean free paths in the nano to microscale and mean free times on the order of the picosecond timescale, while acoustic THz and infrared wavelengths are especially contributing to thermal transport. As a consequence, material shaping at nanoscale or ultrafast pump-probe investigations allow for tuning thermal transport in nanomaterials. The consequences can be observed on the thermal conductivity levels or at the spectral levels. In addition, local nonequilibrium, ballistic transport, near-field and nonlinear effects such as rectification are expected to play significantly on the nanoscale engines/thermodynamic cycles involving nanomaterials. Applications for thermoelectric, thermophotovoltaic and other types of heat-to-electricity conversion devices are expected to be especially affected.

As a result, the goal of this symposium is therefore to present recent results and novel concepts. Particular attentions will be paid to bridge gaps between experiments and modeling, for fundamental issues and applications, in order to move towards a deeper understanding of the physics and the related devices.

Thermal and radiative properties of materials at the micro/nanoscale are not well described by the usual laws governing their properties at the macroscopic scale, derived from Fourier and Planck blackbody frameworks. The length scale and the shape of the systems affect the dynamics of the heat carriers, electrons, phonons and photons. Ballistic transport, scattering at boundaries and interfaces, interplay between energy carriers and sub-wavelength effects are key phenomena that lead to deviations from the macroscopic theories.

Many applications of these effects have already been identified, ranging from energy conversion devices to thermal management in nanodevices, phase change materials, magnetic memory and coherent transport. Nanostructuring allows the coupling of surface waves and pave the way to the design of new monochromatic and/or directional energy transport.

Although considerable progress has been made, the fundamental understanding of heat transport at short time and length scales and the impact on the heat-to-electricity conversion devices remain incomplete. Despite the tremendous recent advancement in heat-conduction based and radiative experimentation at the nanoscale in terms of sensitivity and accuracy, measurements with high resolution in time and space remain very challenging. Measurements on both "academic" or "real" structures are currently investigated, involving deposition of heaters and sensors on given samples, noninvasive sensing by means of contact scanning-probe or non-contact optical techniques. Energy carrier mean-free paths may cover several length scales, from the nanometer to very-long distances, thereby making the computational modeling less straightforward and calling for breakthroughs in atomistic simulations and their coupling to tools at larger scales, for instance involving the Boltzmann transport equations for the different energy carriers. Nanostructuring is used for its benefits on thermal conductivity decrease for thermoelectricity but its effect on electronic transport is still under study. The understanding and use of coherent effects in thermal radiation and heat conduction has been previously limited to low temperatures and is progressing towards room temperature. The consequences on bio-molecules are also of great interest though their study is still a challenge. Understanding the coupling between plasmons and phonons remains an important and rarely addressed issue. A lot of effort has been devoted to the thermal management of nanodevices, from the source due to electron-phonon scattering to the dissipation, thermal interface materials, for both cooling and thermal insulation of nanodevices.

Given the above context and open issues, this symposium will provide a forum to show and discuss latest advances on these topics. Our aim is to gather experimentalists and theoreticians from the fields of heat conduction, near-field or sub-wavelength thermal radiation and photonic/phononic/electronic devices. One aim is to expand to concepts of nanothermodynamics and local nonequilibrium thermodynamics.

Hot topics to be covered by the symposium:

- Nanoscale heat transport phenomena (e.g. quasi - ballistic transport, localization)
- Thermal transport at interfaces
- Thermal transport in disordered and amorphous materials
- Thermal transport in liquids and soft and biological matter
- Near-field thermal radiation, phononics and metamaterials
- Non-equilibrium and picosecond thermal transient behaviors
- Thermal transport characterization techniques (e.g. mean-free path spectroscopies)
- New formalisms or simulation techniques of thermal transport
- Interactions among different types of energy carriers (e.g. phonons, electrons, magnons, photons)
- Thermal energy harvesting and storage materials
- Thermoelectric and thermophotovoltaic energy conversion
- Thermal transport in 2D, 1D and 0D materials, and extreme conditions
- Radiative cooling and thermal radiation and in the near-field or involving sub - wavelength objects such as metamaterials
- Applications to thermodynamic cycles, engines and heat to - electricity conversion devices
- Fundamentals and statistical physics grounds of thermal transport

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Deadline for abstract submission: **20th May, 2019**

www.european-mrs.com

Introduction and scope:

The Symposium is devoted to the presentation of original contributions on fundamental research of the surface, interface and bulk properties of the energy related materials using the X-ray based state of the art techniques.

The sustainable energy related materials research is now the top priority among the material research community. The X-ray based techniques (photon in - photon out and/or photon in - electron out) are instrumental to study the physiochemical properties of materials. In particular, the characterization techniques such like XPS, XAS, PEEM, LEEM, LEED, XRD, XES, etc. can be used to study the spectro-microscopic and crystallographic properties of sample surface and bulk.

The X-ray based characterization techniques can inform about the electronic and/or chemical properties of the materials and their effect on the performance of the devices. Moreover, the dependence of physiochemical properties on the morphology and size of the material can also be analyzed.

The techniques used in equilibrium can only inform about the static physiochemical properties while in operando conditions the mechanism of various process deciding the activity of the materials can be explained.

The symposium aims to cover four main divisions of sustainable energy materials research such as photoelectrochemical water splitting devices, solar cells, Li ion batteries, and fuel cells. Papers related to all aspects of the fundamental properties of the energy related materials used in the above mentioned devices and investigated by laboratory and synchrotron based X-ray methods are invited.

Hot topics to be covered by the symposium:

- Effect of surface and interface properties on photoelectrochemical water splitting
- X-ray based characterization of contemporary photovoltaic (perovskite solar cells, CIGS, III-V solar cells)
- Solid/electrolyte interface, material development, stability, electrolyte for Li ion battery
- Development of materials for fuel cells and their X-ray based characterization methods
- Ex-situ, in-situ and in-operando studies of photocatalysts, Li ion batteries and solar cells
- Development of new materials for sustainable energy technology
- Investigation of surface and interface of energy materials using various X-ray based techniques
- Fundamental electronic properties of materials

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Introduction and scope:

The symposium continues the tradition of the successful editions of previous years (2009 - 2018). These symposia, with in total 1786 presentations by the participants from 43 countries, established a creative environment for an innovative exchange via discussions on bio-inspired and bio-integrated materials. The hierarchical materials, tailored down to the atomic scale, exhibit unique anisotropic properties. Their understanding will pave the way towards the development of smart solutions in health care and environmental security.

The symposium will focus on the most recent advances in nanoscience and nanotechnology for smart and multi-functional materials and interfaces in biomedical engineering as well as environmental control and security.

This symposium will again encourage interdisciplinary discussions on bio-inspired and bio-integrated materials, which include electronic, photonic, magnetic nano-systems. Students, scientists and experts are openly invited from any materials-related discipline. Contributions are solicited on the following and related topics: design and engineering of materials responsive to external physical, chemical and biological stimuli, materials for regenerative medicine with focus on hard tissues (bone and teeth), and engineering of bio-interfaces and bio-templates.

In light of recent technological progress in the field, the organizers have invited the investigators of the EU COST actions and the EU HORIZON 2020-2025 projects to give a dedicated insight into their current scientific activities.

The Young Scientist Forum, a session devoted for presenters on post-graduate and (PhD-)student's level will take place at the symposium's second day.

Hot topics to be covered by the symposium:

- Biomimetic materials synthesis
- Preparation of bio-inspired inorganic nanoparticles
- Design and engineering of smart supramolecular carbon-based materials
- Characterization of bio-responsive nanomaterials
- Additive manufacturing in biomedical engineering
- Nano-robots
- Neuro-electronics
- Materials with diagnostic/sensing capabilities

Focused Sessions will based on these topics.

Special Forum (Honorary Distinguished Lecture) in honour of the 80th birthday of Nobel Laureate (Chemistry, 1987) Professor Jean-Marie Lehn, University of Strasbourg, CNRS, France, entitled Design and synthesis of smart molecules for regenerative medicine.

Invited Partner – International Journal of NANOMEDICINE, Editor-in-Chief Dr. Tomas J. Webster (5 year IF = 5.038)
<https://www.dovepress.com/journal-editor-international-journal-of-nanomedicine-eic5>

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Deadline for abstract submission: **20th May, 2019**

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Full information about the scientific programme, abstract submission, registration and accommodation can be found through the link to

www.european-mrs.com

For general information about the conference contact the E-MRS Fall Meeting Conference Secretary

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All information regarding a specific symposium can be obtained by making direct contact with the symposium organisers. The email addresses will be found at the end of the description of each symposium given in this announcement.

LANGUAGE

The conference language is English.

CONFERENCE VENUE



**Central Campus of
Warsaw University of
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Many places of interest are within easy walking distance of the University. The area around the campus has a 'student town' atmosphere with many student pubs, which are excellent places to meet and share experiences after the symposia.

Good public transport connections to the university, by metro, tramway, or by bus are available from anywhere in Warsaw. The Central Campus is located just 10 minutes from the city centre and 20-30 minutes from the Old Town.

REGISTRATION

All participants (including chairpersons, authors, presenting authors, invited speakers, scientific committee members...) must register. Online registration and payment is recommended to avoid long queues.

PLEASE NOTE: Registration for the conference and abstract submission are separate items and are not linked.

On-line registration is open until 2nd September, 2019.

On-site registration will be open on Sunday, September 15th, 2019, from 14:00 to 18:00 and during the conference from 08:00-18:00.

On-site payment hours:

| | |
|--|---------------|
| Sunday, September 15 th , 2019 | 14:00 - 18:00 |
| Monday, September 16 th , 2019 | 08:00 - 18:00 |
| Tuesday, September 17 th , 2019 | 08:00 - 18:00 |
| Wednesday, September 18 th , 2019 | 08:00 - 18:00 |
| Thursday, September 19 th , 2019 | 08:00 - 18:00 |

REGISTRATION FEES

FULL RATE

including: access to symposia, access to poster sessions, access to exhibition, access to workshops & tutorials, conference booklet, lunches from Mon. to Thu., coffee breaks, social event, E-MRS membership for one year and one proceedings volume (if applicable).

| | |
|--------------------------------------|-------------|
| BEFORE August 9 th , 2019 | 430 EUR net |
| AFTER August 9 th , 2019 | 520 EUR net |
| ON SITE | 560 EUR net |

Deadline for abstract submission: **20th May, 2019**

www.european-mrs.com

STUDENT RATE

including: access to symposia, access to poster sessions, access to exhibition, access to workshops & tutorials, conference booklet, lunches from Mon. to Thu., coffee breaks, social event, E-MRS membership for one year and one proceedings volume (if applicable). (Students have to give evidence of their university registration at the main desk)

| | |
|--------------------------------------|-------------|
| BEFORE August 9 th , 2019 | 260 EUR net |
| AFTER August 9 th , 2019 | 350 EUR net |
| ON SITE | 390 EUR net |

E-MRS is a non-profit organization, no subject to VAT.

The following payment options are offered:

- Credit card (Carte Bleue, Visa, Eurocard/Mastercard)
- Cheque (to the order of E-MRS)
- Bank transfer (cf. BANK INFORMATION section)

NB: Purchase order from company are accepted too.

IMPORTANT DEADLINES

- May 20th, 2019: Deadline for abstract submission.
- June 28th, 2019: Notification of acceptance and mode of presentation.
- August 9th, 2019: Last day for early registration at the reduced fee.

Please note that the early registration fee is applicable only for a participant who registers and submits payment by 9th August, 2019.

ABSTRACT SUBMISSION

Abstract length: Website submissions are limited to 1500 characters. (plain text only, no figures, no formulae...)

Note: All abstracts must be submitted through the E-MRS website at www.european-mrs.com

Submitting abstracts through the website is very easy. Follow the step-by-step instructions on the template, making sure that the complete mailing address is included for the presenting and corresponding authors. After submitting the abstract, please use the given Control ID number in all communications with E-MRS regarding the abstract UNTIL a paper number (e.g., A 8) has been assigned. After that date, any change must be submitted to: emrs@inmat.pw.edu.pl with the Subject: Abstract Revision and the email must include your Paper number. Please state exactly where the text revisions are located (e.g., title, author, body, etc)

POSTER PRESENTATIONS

Poster sessions will be held on 16th and 17th of September. The authors presenting posters are required to be present at the appropriate session to discuss or defend the paper.

The maximum poster size is A0 (841×1189 mm); No tapes or pins will be needed for hanging posters;

The posters must be removed immediately after the session and the Conference Organisers accept no responsibility for posters left up after this time.

Conference participants may preview the posters during the morning and afternoon sessions, before the formal poster sessions.

ORAL PRESENTATIONS

Duration of oral presentations, including discussion, depends on the Symposium Organisers but the strong recommendations are:

- 45 minutes for plenary talks,
- 30 minutes for invited talks,
- 15 minutes for contributed talks.

Close adherence to these times will enable participants to move seamlessly from one symposium to another

GRADUATE STUDENT AWARD

E-MRS announces the availability of awards (up to 2 per symposium) for graduate students conducting research on a topic to be addressed in a symposium held during the E-MRS 2019 Fall Meeting.

Each award will consist of a grant of 350 EUR which will be presented with a diploma

Criteria for selection are:

- Participation at the E-MRS 2019 Fall Meeting as an attendee and author or co-author of a symposium paper and must be entrusted with the (oral or poster) presentation of the paper
- Outstanding performance in the conduct of this project and promise for future substantial achievement in materials research as judged by the faculty advisor
- Significant and timely research results

Application materials required:

- Application form duly completed
- Abstract of paper to be presented at the meeting
- Letter of support from research supervisor

Submit the complete application form by email emrs@pw.edu.pl to the E-MRS Secretariat by July 15th, 2019 at the latest.

Winners will be notified on-site directly by the concerned symposium organizer.

E-MRS Graduate Student Award winners must be present during the ceremony on Wednesday evening, 18th September, to get their prizes.

Deadline for abstract submission: **20th May, 2019**

www.european-mrs.com

CONFERENCE SCIENTIFIC PROGRAMME

The complete scientific program will be available on the website from mid July 2019.

EXHIBITION

The industrial exhibition will be held from September 16th – 18th in the historic Main Hall of Warsaw University of Technology, close to the symposium rooms. The Main Hall is also the venue for all refreshment breaks between the scheduled sessions to facilitate the maximum contact between exhibitors and participants.

The Exhibition at the 2019 E-MRS Fall Meeting will provide an excellent opportunity for participants to become acquainted with some of the latest equipment and services relevant for materials science research and to obtain information, costs and availability.

PROCEEDINGS

The submitted manuscripts being considered for publication will be subjected to a peer review procedure. The decisions on the deadline and procedure for submitting manuscripts are made by the SYMPOSIUM ORGANISERS. The authors of papers accepted for presentation at the conference should ensure that they have the appropriate instructions for preparing the manuscript.

ACCOMMODATION

Nobell Congressing, as the OFFICIAL HOTEL PROVIDER FOR E-MRS 2019 FALL MEETING, is pleased to offer you various standards of accommodation at discounted rates. We offer hotel accommodation in hotels located a few steps from a conference venue – in walking distance. You may choose from a range of hotel standards to suite all budgets. All prices are discounted specifically for participants at the E-MRS 2018 Fall Meeting s. Book your hotel at <https://emrs.nobell.pl/hotels>.

Booking team

Nobell Congressing
Norbert Karczmarczyk
phone: +48 22 621 67 37
email: norbert@nobell.pl

Please note that hotel booking and conference registration are totally separate systems and are not linked in any way.

SOCIAL EVENT

All participants are invited to attend the Conference Reception on Wednesday September 18th, 2019 starting at 18:00. Musical entertainment and refreshments will be provided as part of conference arrangements. Symposium organizers and Graduate Student Award winners will be honoured at the commencement of the reception.

AUDIOVISUAL EQUIPMENT

For the oral presentations - the following equipment will be available:

- laptops with XP or Windows 7 and Microsoft Office Power Point. It is preferable that presentations are on CD or USB flash memory stick, if an author requires something else please contact the organisers
- digital projector
- laser pointers and microphones if necessary

INTERNET ACCESS / WIFI

The Computer Lab will be open from 8:00 to 18:00 for all participants during the conference. In addition wireless access to the internet will be provided for all conference participants possessing their own laptops.

PASSPORTS AND VISAS

Citizen having passports from certain countries need a visa to enter Poland. If you need any assistance to obtain your visa, please contact us as soon as possible (indicate your address, date and place of birth, your passport number and date of expiration).

By email: emrs@pw.edu.pl

Subject: VISA ASSISTANCE - FALL MEETING

All letters of invitation will be sent by airmail and by PDF e-mail attachment unless a courier account number is provided with the original request. E-MRS is not able to contact Embassies in support of an individual attempting to gain entry to attend the meeting. Because the application for a visa can be a lengthy process, we recommend that you start your visa application process as soon as you have been notified that your paper has been accepted. We also recommend that you secure your travel visa before registering for the symposium.

LETTERS OF INVITATION

The Scientific Secretariat will, on request, send a personal invitation to participate. This invitation is only to assist potential participants to raise funds or to obtain a visa, and is not a commitment on the part of the organisers to provide any financial support.

LIABILITY

The E-MRS and Local Organizers of the 2019 Fall Meeting cannot accept liability for any personal accidents, loss of belongings or damage to the private property of participants, either during, or directly arising from, the E-MRS 2019 Fall Meeting. Participants are requested to make their own arrangements with respect to health, travel and property insurance before leaving for the conference. Participants who are citizens of a European Union member state may obtain a European Health Insurance Card which gives some entitlement to medical treatment whilst in Poland.

GETTING TO and AROUND WARSAW

**By plane**Warsaw Chopin Airport

Departures and Arrivals Information, phone + +48 22 650 42 20

On-line timetable www.lotnisko-chopina.pl

Warsaw's Chopin Airport is located about 10 km from the city centre, which can be easily reached by car, public bus or taxi. <https://www.lotnisko-chopina.pl/en/index.html>

Warsaw Modlin Airport

Airport Information, phone +48 22 315 18 80

Airport webpage: <http://www.modlinairport.pl/>

Train: By Modlin shuttle-bus to Modlin train station, then by train (KM) to Central Railway Station. (4-5 €)

Bus: Modlin-bus connects Modlin Airport and Central Railway Station

**Taxis**

For arrivals at Chopin airport use the official taxi rank as the airport is served only by 3 Radio-Taxi companies: Ele Taxi, iTaxi and MPT Taxi and the fare to the city centre should not exceed 40PLN. When using taxis in Warsaw, it is strongly recommended that you use only those showing: the symbol of Warsaw – a mermaid – on both front doors, yellow/red stripes affixed to the glass along the front doors, a number on the side of the vehicle, a hologram with the licence number and the vehicle's registration number on the upper right-hand corner of the front glass and a sticker with price information per kilometer displayed on the glass of the right-hand side back door. It is recommended that you use one of the city's official Radio-Taxi companies shown above, and order a taxi by telephone or through your hotel.

**By train**

There are three train stations in Warsaw that handle international and domestic traffic:

- Warszawa Centralna (Central Warsaw) (Aleje Jerozolimskie 54) - situated in the city centre with very good connections to all parts of the city.
- Warszawa Zachodnia (West Warsaw) (Aleje Jerozolimskie 144) – adjacent to the international bus terminal where those travelling in or out of the country make their transfers.
- Warszawa Wschodnia (East Warsaw) (Lubelska 1) - located on the east side of Vistula River (Praga)

Railway tickets can be purchased using cash or credit cards at the windows (kasa) in the stations, on the Internet or at selected travel agencies. You can also purchase your ticket on the train from the conductor, immediately after boarding the train. This is not applicable for travel on the Intercity Pendolino services as prior reservation is mandatory. Tickets sold on the train are subject to an additional fee.

The train Timetable is available at: www.pkp.pl or www.intercity.pl

**Parking**

There is no free parking around the Conference Venue.

The whole area of Warsaw city centre is a controlled parking zone. This rule applies from Monday to Friday, from 8 am to 6 pm. On Saturdays, Sundays and public holidays parking is free.

Warsaw Car parks system "Park & ride":

<http://www.ztm.waw.pl/parkujjedz.php?c=116&l=2>

Useful links:

<http://www.ztm.waw.pl/>

<http://warsawtour.pl/en>

**LOCAL PUBLIC TRANSPORT**

The WUT Central Campus can be easily reached using public transport. The tram stop "Plac Politechniki" for lines 10, 14 and 15 is immediately outside the university and the Metro station "Politechnika" is a 10 min. walk from the venue.

From the city centre's main railway station "Warszawa Centralna" it is about a 20 min. walk, or 3 min. by tram No. 10, to the conference venue. Tram 10 departs from the stop "Dworzec Centralny" in the direction "Wyscigi" and "Służewiec" every 10-15 minutes. There are three stops to the "Plac Politechniki" tram stop.

The local trains (SKM -Fast Urban Railway, and KM - Masovian Railways), buses, trams and metro require a valid ticket – the one-way price is 1-2 € and can be bought in any kiosk, in ticket machines at most bus stops or inside trains and buses) or from the bus or tram driver.

E-MRS
BP 20
67037 Strasbourg Cedex 2
France

Motif de non distribution / not deliverable for doe following reason :

- ☐ Adresse insuffisante / Insufficient address
- ☐ Inconnu / Unknown
- ☐ Refusé / Refused
- ☐ Parti sans laisser d'adresse / Moved without leaving address
- ☐ Auture / Other